

QUICK FROZEN CRITTERS

OBJECTIVES:

Students will: 1) discuss predator/prey relationships, including adaptations; 2) describe the importance of adaptations in predator/prey relationships; and 3) recognize that limiting factors - including predator/prey relationships affect wildlife populations.

METHODS:

Students play an active version of “freeze tag.”

BACKGROUNDS:

NOTE: This activity is best done after one or more that introduces the concepts of “adaptation” and “limiting factors.” See the cross-references for suggestions. **Predator** An animal that kills and eats other animals for food. **Prey** An animal that is killed and eaten by other animals for food. **Limiting Factors** There are many influences in the life history of any animal. When one of these (e.g., disease, climate, pollution, accidents, shortages of food) exceeds the limits of tolerance of that animal, it becomes a limiting factor. It then drastically affects the well being of that animal. **Predators** are limiting factors for prey. **Prey** are limiting factors for predators. Animals display a variety of behaviors in predator/prey relationships. These are adaptations to survive. Some prey behaviors are: signaling to others, flight, posturing in a fighting position, scrambling for cover and even “freezing” on the spot to escape detection or capture by predators. The kind of behavior exhibited partly depends on how close the predator is when detected by the prey. Each animal has a threshold for threat levels. If a predator is far enough away for the prey to feel some safety, the prey may signal to others that a predator is near. If the predator comes closer, the prey may try to run away. If the predator is too close to make running away feasible, the prey may attempt to scurry to a hiding place. If the predator is so close that none of these alternatives is available, the prey may freeze in place. The closer the predator comes to the prey animal, the more likely it is that the prey will “freeze” in place. This “freezing” occurs as a kind of physiological shock in the animal. (Shelter or camouflage may also make them invisible to the predator when they freeze.) Too often people who come upon animals quickly and see them immobile infer that the animals are unafraid when, in reality, the animals are “frozen”, or, as the adage goes, “frozen stiff”. The major purpose of this activity is for students to recognize the importance of adaptations to both predators and prey and to gain insight into limiting factors affecting wildlife populations.

MATERIALS:

Food tokens (pieces of cardboard), enough for three per student; gym vests or other labeling devices to mark predators; four or five hula hoops to serve as “cover” markers; pencil and paper to record number of captures, if desired.

PROCEDURE:

Select any of the following pairs of animals:

Prey	Predators
cottontails	coyotes
ground squirrels	hawks
deer	cougar
quail	foxes

Identify students as either “predators” or “prey” for a version of “freeze tag”-with approximately one predator per every four to six prey. Using a gymnasium or playing field, identify one end of the field as the “food source” and the other end as the “shelter”. Four to five hula-hoops are placed on the open area between the “shelter” and the “food”. These represent additional shelter or “cover” for the prey and can be randomly distributed on the field. (If hula hoops are not available, string might be used, or chalk on asphalt.) Food tokens are placed in the “food source” zone on the ground. Allow three food tokens for each prey animal. Predators should be clearly identified. Gym vests or safety patrol vests might be available. Use a whistle or some other pre-arranged signal to start each round. When a round begins, prey start from their “shelter”. The task of the prey animals is to move from the primary shelter to the food source, collecting one food token each trip, and returning to the primary shelter. To survive, prey have to obtain three food tokens. Their travel is hazardous, however. They need to be alert to possible predators. If they spot a predator, they can use various appropriate prey behavior - including warning other prey that a predator is near. Prey have two ways to prevent themselves from being caught by predators: they may “freeze” any time a predator is within five feet of them; or they may run for cover (with at least one foot within one of the hula hoops.) Frozen prey may blink, but otherwise should be basically still without talking. Predators start the activity anywhere in the open area between ends of the field and thus are randomly distributed between the prey’s food and the primary shelter. Predators attempt to capture prey to survive, tagging only moving (not “frozen) prey. (OPTIONAL: Prey can have bandanas in their pockets that the predators have to capture to represent the successful predation.) Predators must each capture two prey in order to survive. Captured prey is taken to the sidelines by the predator who captured them. NOTE: Establish a ground rule for student behavior: Behave in ways that are not harmful to other students, even when simulating predator behavior; e.g., no full tackles! A time limit of five to seven minutes is suggested for each round of the game. (Captured prey on the sidelines will get restless if rounds are much longer.) Remind prey that they can remain frozen for as long as they like, but if they do not have enough food at the end of the activity they will starve to death. In nature, an animal must balance the need to find food with sometimes conflicting need for safety. Play four rounds, allowing each student to be both prey and predator. Discuss with the students the ways they escaped capture when they were prey. Which ways were easiest? Which were most effective? What means did they use as predators to capture prey? Which ways were best? What did the predators do in response to a prey animal who “froze”? In what ways are adaptations important to both predator and prey? Ask the students to summarize what they have learned about predator/prey relationships. How do predator/prey relationships serve as natural limiting factors affecting wildlife?

VARIATIONS AND EXTENSIONS

1. Conduct the activity for three or four rounds, recording the number of captures each playing period. Have students who are captured become predators, and each predator not getting enough food become a prey animal in the succeeding round. This quickly leads to the concept of dynamic balance as prey and predator populations fluctuate in response to each other.
2. Have the students walk only, or assign different locomotive forms to each animal.
3. Select an animal and research its behavior patterns for avoiding detection and capture. Reports or demonstrations of the behavior could be presented to the class.

AQUATIC EXTENSIONS

1. Do this activity again, using aquatic predator and prey species.
2. “Swim” toward your food while portraying trumpet fish, flounder, stonefish or other marine organisms that “freeze” as a defense mechanism.
3. If possible, conduct the activity in the shallow end of a real swimming pool. Hula-hoops will float!

EVALUATION

1. Pick any predator and prey. Describe each animal's adaptations.
2. Identify an adaptation used by a prey species to stay alive. Create or tell a story about an imaginary person who might have used a similar adaptation to survive a difficult situation.

Age: Grades 4-6 (can be modified for younger and older students; simplify the discussion for younger students)

Subjects: Science, Physical Education (Language Arts optional: See Variations and Extensions) Skills: Analysis, description, discussion, evaluation, generalization, kinesthetic concept development, observation, and psychomotor development Duration: 20-25 minutes Group Size: best with at least ten students; one "predator" per every four to six "prey" Setting: indoors or outdoors Key Vocabulary: predator, prey, adaptation